IN THE CLAIMS

The following listing of the claims is provided in accordance with 37 C.F.R.
§1.121.

1. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for two or more organs from at least one of one or
more types of electrical sensors and one or more types of non-electrical sensors;

processing the set of motion data to extract two or more prospective gating points
and two or more retrospective gating points for an organ of interest;

acquiring a set of image data representative of the organ of interest using the two or
more prospective gating points; and

processing a portion of the set of image data based upon the two or more
retrospective gating points; and

displaying or storing an image generated from the portion of the set of image data.

2. (original) A computer program, provided on one or more computer readable media, for
imaging an organ, comprising:

a routine for acquiring a set of motion data for two or more organs from at least one
of one or more types of electrical sensors and one or more types of non-electrical sensors;

a routine for processing the set of motion data to extract two or more prospective
gating points and two or more retrospective gating points for an organ of interest;

a routine for acquiring a set of image data representative of the organ of interest
using the two or more prospective gating points; and

a routine for processing a portion of the set of image data based upon the two or
more retrospective gating points.

3. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of two or more organs to derive two or more retrospective gating points for at least one of the organs, and to process a portion of the plurality of signals based upon the two or more retrospective gating signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of at least one of the two or more organs within the region of interest to contribute to the set of motion data.

4. (original) An imaging system, comprising:

means for acquiring a set of motion data for two or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points; and

means for processing a portion of the set of image data based upon the two or more retrospective gating points.

5. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for two or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

reconstructing the set of image data to generate a set of reconstructed data; ~~and~~

processing a portion of the set of reconstructed data based upon the two or more retrospective gating points<u>; and</u>

<u>displaying or storing an image generated from the portion of the set of reconstructed data</u>.

6. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for two or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

a routine for reconstructing the set of image data to generate a set of reconstructed data; and

a routine for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points.

7. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of two or more organs to derive two or more retrospective gating points for at least one of the organs, to reconstruct the plurality of signals to generate a set of reconstructed data, and to process a portion of the reconstructed data based upon the two or more retrospective gating signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of at least one of the two or more organs within the region of interest to contribute to the set of motion data.

8. (original) An imaging system, comprising:

means for acquiring a set of motion data for two or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

means for reconstructing the set of image data to generate a set of reconstructed data; and

means for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points.

9. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for an organ of interest from at least one or more non-electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

acquiring a set of image data representative of the organ of interest using the two or more prospective gating points; and

processing a portion of the set of image data based upon the two or more retrospective gating points; and

displaying or storing an image generated from the portion of the set of image data.

10. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for an organ of interest from at least one or more non-electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points; and

a routine for processing a portion of the set of image data based upon the two or more retrospective gating points.

11. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of an organ of interest to derive two or more retrospective gating point for the organ, and to process a portion of the plurality of signals based upon the two or more retrospective gating signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to measure non-electrical activity indicative of the motion of the organ of interest to contribute to the set of motion data.

12. (original) An imaging system, comprising:

means for acquiring a set of motion data for an organ from at least one or more non-electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points; and

means for processing a portion of the set of image data based upon the two or more retrospective gating points.

13. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for an organ of interest from at least one or more non-electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

reconstructing the set of image data to generate a set of reconstructed data; and

processing a portion of the set of reconstructed data based upon the two or more retrospective gating points; and

displaying or storing an image generated from the portion of the set of reconstructed data.

14. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for an organ of interest from at least one or more non-electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

a routine for reconstructing the set of image data to generate a set of reconstructed data; and

a routine for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points.

15. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of an organ of interest to derive two or more retrospective gating points, to reconstruct the plurality of signals to generate a set of reconstructed data, and to process a portion of the reconstructed data based upon the two or more retrospective gating signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to measure non-electrical activity indicative of the motion of the organ of interest to contribute to the set of motion data.

16. (original) An imaging system, comprising:

means for acquiring a set of motion data for an organ of interest from at least one or more non-electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

means for reconstructing the set of image data to generate a set of reconstructed data; and

means for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points.

17. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for a respiratory organ of interest from at least one or more electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the respiratory organ of interest;

acquiring a set of image data representative of the respiratory organ of interest using the two or more prospective gating points; and

processing a portion of the set of image data based upon the two or more retrospective gating points; and

displaying or storing an image generated from the portion of the set of image data.

18. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for a respiratory organ of interest from at least one or more electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the respiratory organ of interest;

a routine for acquiring a set of image data representative of the respiratory organ of interest using the two or more prospective gating points; and

a routine for processing a portion of the set of image data based upon the two or more retrospective gating points.

19. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of a respiratory organ of interest to derive two or more retrospective gating point for the respiratory organ, and to process a portion of the plurality of signals based upon the two or more retrospective gating signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to measure electrical activity indicative of the motion of the respiratory organ of interest to contribute to the set of motion data.

20. (original) An imaging system, comprising:

means for acquiring a set of motion data for a respiratory organ of interest from at least one or more electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the respiratory organ of interest;

means for acquiring a set of image data representative of the respiratory organ of interest using the two or more prospective gating points; and

means for processing a portion of the set of image data based upon the two or more retrospective gating points.

21. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for a respiratory organ of interest from at least one or more electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the respiratory organ of interest;

acquiring a set of image data representative of the respiratory organ of interest using the two or more prospective gating points;

reconstructing the set of image data to generate a set of reconstructed data; ~~and~~

processing a portion of the set of reconstructed data based upon the two or more retrospective gating points; and

<u>displaying or storing an image generated from the portion of the set of reconstructed</u>
<u>data</u>.

22. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for a respiratory organ of interest from at least one or more electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the respiratory organ of interest;

a routine for acquiring a set of image data representative of the respiratory organ of interest using the two or more prospective gating points;

a routine for reconstructing the set of image data to generate a set of reconstructed data; and

a routine for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points.

23. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of a respiratory organ of interest to derive two or more retrospective gating points, to reconstruct the plurality of signals to generate a set of reconstructed data, and to process a portion of the reconstructed data based upon the two or more retrospective gating signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to measure electrical activity indicative of the motion of the respiratory organ of interest to contribute to the set of motion data.

24. (original) An imaging system, comprising:

means for acquiring a set of motion data for a respiratory organ of interest from at least one or more electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the respiratory organ of interest;

means for acquiring a set of image data representative of the respiratory organ of interest using the two or more prospective gating points;

means for reconstructing the set of image data to generate a set of reconstructed data; and

means for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points.

25. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for an organ of interest from one or more non-electrical sensors and one or more electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

acquiring a set of image data representative of the organ of interest using the two or more prospective gating points; and

processing a portion of the set of image data based upon the two or more retrospective gating points; and

<u>displaying or storing an image generated from the portion of the set of image data.</u>

26. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for an organ of interest from one or more non-electrical sensors and one or more electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points; and

a routine for processing a portion of the set of image data based upon the two or more retrospective gating points.

27. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of an organ of interest to derive two or more retrospective gating point for the organ, and to process a portion of the plurality of signals based upon the two or more retrospective gating signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry;

a sensor-based motion measurement system configured to measure non-electrical activity indicative of the motion of the organ of interest to contribute to the set of motion data; and

a sensor-based motion measurement system configured to measure electrical activity indicative of the motion of the organ of interest to contribute to the set of motion data.

28. (original) An imaging system, comprising:

means for acquiring a set of motion data for an organ from one or more non-electrical sensors and one or more electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points; and

means for processing a portion of the set of image data based upon the two or more retrospective gating points.

29. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for an organ of interest from one or more non-electrical sensors and one or more electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

reconstructing the set of image data to generate a set of reconstructed data; ~~and~~

processing a portion of the set of reconstructed data based upon the two or more retrospective gating points; and

displaying or storing an image generated from the portion of the set of reconstructed data.

30. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for an organ of interest from one or more non-electrical sensors and one or more electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

a routine for reconstructing the set of image data to generate a set of reconstructed data; and

a routine for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points.

31. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of an organ of interest to derive two or more retrospective gating points, to reconstruct the plurality of signals to generate a set of reconstructed data, and to process a portion of the reconstructed data based upon the two or more retrospective gating signals;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry;

a sensor-based motion measurement system configured to measure non-electrical activity indicative of the motion of the organ of interest to contribute to the set of motion data;

a sensor-based motion measurement system configured to measure electrical activity indicative of the motion of the organ of interest to contribute to the set of motion data.

32. (original) An imaging system, comprising:

means for acquiring a set of motion data for an organ of interest from one or more non-electrical sensors one or more electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for the organ of interest;

means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

means for reconstructing the set of image data to generate a set of reconstructed data; and

means for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points.

33. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for one or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

processing a portion of the set of image data based upon the two or more retrospective gating points; and

compensating for motion in the portion of the set of image data based upon a set of motion compensation factors derived from one or more pre-acquisition images; and

<u>displaying or storing an image generated from the portion of the set of image data</u>.

34. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for one or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

a routine for processing a portion of the set of image data based upon the two or more retrospective gating points; and

a routine for compensating for motion in the portion of the set of image data based upon a set of motion compensation factors derived from one or more pre-acquisition images.

35. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of one or more organs to derive two or more retrospective gating points for at least one of the organs, to process a portion of the plurality of signals based upon the two or more retrospective gating signals, and to compensate for motion in the portion of the set of image data based upon a set of motion compensation factors derived from one or more pre-acquisition images;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of the one or more organs within the region of interest to contribute to the set of motion data.

36. (original) An imaging system, comprising:

means for acquiring a set of motion data for one or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

means for processing a portion of the set of image data based upon the two or more retrospective gating points; and

means for compensating for motion in the portion of the set of image data based upon a set of motion compensation factors derived from one or more pre-acquisition images.

37. (currently amended) A method for imaging an organ, comprising the steps of:

acquiring a set of motion data for one or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

reconstructing the set of image data to generate a set of reconstructed data; and

processing a portion of the set of reconstructed data based upon the two or more retrospective gating points; ~~and~~

compensating for motion in the portion of the set of reconstructed data based upon a set of motion compensation factors derived from one or more pre-acquisition images; and

displaying or storing an image generated from the portion of the set of reconstructed data.

38. (original) A computer program, provided on one or more computer readable media, for imaging an organ, comprising:

a routine for acquiring a set of motion data for one or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

a routine for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

a routine for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

a routine for reconstructing the set of image data to generate a set of reconstructed data;

a routine for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points; and

a routine for compensating for motion in the portion of the set of reconstructed data based upon a set of motion compensation factors derived from one or more pre-acquisition images.

39. (original) An imaging system, comprising:

an imager configured to generate a plurality of signals representative of a region of interest;

data acquisition circuitry configured to acquire the plurality of signals;

data processing circuitry configured to receive the plurality of signals, to process a set of motion data describing the motion of one or more organs to derive two or more retrospective gating points for at least one of the organs, to reconstruct the plurality of signals to generate a set of reconstructed data, to process a portion of the reconstructed data based upon the two or more retrospective gating signals, and to compensate for motion in the portion of the set of reconstructed data based upon a set of motion compensation factors derived from one or more pre-acquisition images;

system control circuitry configured to operate at least one of the imager and the data acquisition circuitry based upon two or more prospective gating points derived from the set of motion data;

an operator workstation configured to communicate with the system control circuitry and to receive at least the processed portion of the plurality of signals from the data processing circuitry; and

a sensor-based motion measurement system configured to measure electrical or non-electrical activity indicative of the motion of the one or more organs within the region of interest to contribute to the set of motion data.

40. (original) An imaging system, comprising:

means for acquiring a set of motion data for one or more organs from at least one of one or more types of electrical sensors and one or more types of non-electrical sensors;

means for processing the set of motion data to extract two or more prospective gating points and two or more retrospective gating points for an organ of interest;

means for acquiring a set of image data representative of the organ of interest using the two or more prospective gating points;

means for reconstructing the set of image data to generate a set of reconstructed data;

means for processing a portion of the set of reconstructed data based upon the two or more retrospective gating points; and

means for compensating for motion in the portion of the set of reconstructed data based upon a set of motion compensation factors derived from one or more pre-acquisition images.